

**Notice of Allowability**

Application No.

10/005,104

Examiner

Qutub Ghulamali

Applicant(s)

BJERKE ET AL.

Art Unit

2611

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 8/23/2006.
2. ☒ The allowed claim(s) is/are 1-8,10-13,16 and 18-46.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some\* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

### **DETAILED ACTION**

1. This Office Action is in response to amendment filed 08/23/2006.

#### ***Response to Amendment***

2. Applicant's remarks/amendment, filed 08/23/2006 with respect to claims 1-8, 10-13, 16 and 18-46, have been fully considered and as a result claims 1-8, 10-13, 16 and 18-46, are now indicated allowable. However, in order to advance prosecution in the case, an examiner's amendment was considered necessary, so as to correct some minor deficiencies in the claims.

### **EXAMINER'S AMENDMENT**

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Dmitry R. Milikovsky on 09/18/2006.

4. The application has been amended as follows:

#### **IN THE CLAIMS:**

Claims 1 and 44, lines 6 and 7 respectively, after "for each receive antenna", the words "can be" has been replaced with -- is -- .

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Claim 1, line 18, after "a plurality of times;" the word -- and -- has been inserted.

Claim 1, line 20, after "second a priori information", a -- . -- has been inserted.

Claim 27, line 7, after "a priori information for the coded bits", ",", has been replaced with -- ; -- .

Claim 27, line 8, after "a posteriori information", ",", has been replaced with -- ; -- .

Claim 27, line 11, after "a priori information;", the word -- and -- has been inserted.

Claim 27, last line, after "the decoded bits", a -- . -- has been inserted.

Claim 44, line 16, after "a plurality of times;" the word -- and -- has been inserted.

Claim 44, last line, after "a priori information;", ",", has been replaced with -- . -- .

### ***Allowable Subject Matter***

5. Claims 1-8, 10-13, 16 and 18-46 allowed.

### ***Reason for Allowance***

6. The following is an examiner's statement of reasons for allowance:

Franz discloses a method for recovering data transmitted in a wireless communication system comprising, receiving a first plurality of soft decision symbols plurality of modulation symbols and a plurality of transmitted coded bits, determining a plurality of soft decision symbols based on the received plurality of modulation symbols, determining the first extrinsic information a plurality of times, determining (evaluated)

decoded bits for the first subset of transmitted coded bits based on the first extrinsic information,

determining a second plurality of soft decision symbols for a second subset of the plurality of transmitted-coded bits based on the received plurality of modulation-symbols and second extrinsic information for the second subset of the plurality of transmitted coded bits, determining the second extrinsic information based on the second plurality-of soft decision-symbols and wherein the second extrinsic information is independent of the first extrinsic information, repeating the determining a second plurality of soft decision-symbols and the determining the second extrinsic information a plurality of times, determining decoded bits for the second subset of the plurality of transmitted coded bits based on the second extrinsic information.

Gerlach discloses a system and method receiving a plurality of modulation symbols for a plurality of transmitted coded bits (series of modulated codewords).

However, the prior art as a whole fails to teach determining the first a priori information for the transmitted coded bits, determining a second a priori information based in part on the second a priori information, repeating the determining the plurality of soft decision symbols and the determining the first a priori information a plurality of times, and determining decoded bits for the transmitted coded bits based on the second a priori information, as required by claims 1, 27 and 44. Further the prior art fails to teach at least one data stream, wherein each data stream comprises derive the first a priori information for the coded bits based on a posteriori information and derive a second a

priori information, wherein the detector operative to receive the plurality of modulation symbols from each receive antenna with a respective modulation or coding schemes.

Claims 2-8, 10-13, 16, 18-26, 28-43, 45 and 46 are allowed by virtue of their dependency to base claims highlighted above.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

#### ***Contact Information***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Patents:

Gupta (US Pub. 2003/0112901) discloses a method and apparatus for determining the log-likelihood ratio with pre-coding.

Cameron et al (US Pub. 2004/0240590) shows a decoder design adaptable to decode coded signals using min or max processing.

Edison et al (USP 6,856,656) discloses an iterative carrier phase tracking decoding system.

Edison et al (US Pub. 2002/0034261) shows a rate N/N systematic recursive convolutional encoder and corresponding decoder.

McFarland (USP 6,807,146) shows protocols for scalable system.

Boleskei et al (USP 6,442,214) discloses diversity transmitter and receiver.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qutub Ghulamali whose telephone number is (571) 272-3014. The examiner can normally be reached on Monday-Friday, 7:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

QG.  
September 15, 2006.

  
MOHAMMED GHAYOUR  
SUPERVISORY PATENT EXAMINER